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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte STEVEN J. GEISSLER, TODD G. BATZLER, and MICHAEL D. MADSEN

Appeal 2015-007084
Application 11/876,246
Technology Center 3700

Before MICHELLE R. OSINSKI, JILL D. HILL, and PAUL J. KORNICZKY, *Administrative Patent Judges*.

OSINSKI, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Steven J. Geissler et al. (Appellants)[1] appeal under 35 U.S.C. § 134(a) from the Examiner's decision rejecting claims 1–6, 9–17, 19, and 20 under 35 U.S.C. § 103(a) as unpatentable over Appellants' Admitted Prior Art ("AAPA"),[2] Zhou (CN 2556848 Y, pub. June 18, 2003),[3] and Patterson (US

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[1] Appellants identify the real party in interest as Illinois Tool Works, Inc. Br. 2.

[2] The Examiner refers to Figure 1 of the Specification as AAPA. Final Act. 2.

[3] All references to the text of Zhou are the machine translation entered into the record as an attachment to the Non-Final Office Action (mailed Feb. 21, 2014).

7,080,226 B1, iss. July 18, 2006). We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

THE CLAIMED SUBJECT MATTER

Claims 1, 11, and 17 are independent. Claim 1 is reproduced below and is illustrative of the claimed subject matter on appeal.

> 1. A welding-type power source comprising:
>
> a power conditioner configured to receive power from a power source and condition the power to have characteristics within a predefined set of thresholds;
>
> an inverter configured to receive the conditioned power from the power conditioner and convert the conditioned power to AC power;
>
> a rectifier configured to convert the AC power to DC welding-type power to drive a welding-type process; and
>
> a field programmable gate array (FPGA) processor segregated into at least two functional modules each configured to perform a specific task;
>
> wherein a first functional module controls the power conditioner to condition the power to have characteristics within the predefined set of thresholds, and a second functional module controls the inverter to convert the conditioned power to AC power.

OPINION

Independent claims 1 and 11

The Examiner finds that AAPA teaches most of the limitations of independent claims 1, 11, and 17 including a power conditioner, an inverter, and first and second rectifiers. Final Act. 2. The Examiner also finds that AAPA teaches controller 40 having first functional module 36 that controls

the power conditioner, second functional module 30 that controls the inverter, and third functional module 38 that controls the welding type process, as well as a port map (i.e., lines 32, 34, etc.) linking at least two of the first, second, and third functional modules. *Id.* at 3. The Examiner finds that the controller of the AAPA, however, "is not a FPGA-based processor." *Id.*

The Examiner finds that Zhou teaches an FPGA-based controller for a power source that controls a power conditioner, an inverter, and voltage/current of the power output. *Id.* (citing Zhou, Fig. 1, Abstr., 3:8–9, 13–15, 5). The Examiner also finds that Patterson teaches that a number of modules (e.g., block RAM columns) "can be present on one FPGA . . . and the FPGA configuration data path can enable communication between modules of the FPGA." *Id.* (citing Patterson, 1:10–11, 46–48).

The Examiner concludes that it would have been obvious to a person of ordinary skill in the art at the time of the invention "to replace the micro-processor based controller 40 [of AAPA] with a[n] FPGA-based processor so as to increase reliability and to allow programmability of the FPGA for controlling different components of the power source and to ensure smooth and reliable operation." *Id.* at 3–4 (citing Zhou, 5:3–5).

Appellants argue that "it is unclear how exactly Zhou utilizes FPGA chips within the electric precipitator system" and that Zhou "is substantially incoherent with regard to how the FPGA chips are integrated and utilized." Br. 6–7. In the absence of additional explanation by the Examiner as to Zhou's teachings, we do not discern where the machine translation of Zhou clearly teaches an FPGA-based controller segregated into functional modules that control a power conditioner, an inverter, and voltage/current of

the power output, as found by the Examiner. Final Act. 3 (citing Zhou, Fig. 1; Abstr.; 3:8–9, 13–15; 5).[4] The Examiner's finding appears to be based on speculation and/or conjecture as to how Zhou's FPGA chip is integrated and utilized, rather than being supported by a preponderance of the evidence. Rejections based on 35 U.S.C. § 103(a) must rest on a factual basis. In making such a rejection, the Examiner has the initial duty of supplying the requisite factual basis and may not, because of doubts that the invention is patentable, "resort to speculation, unfounded assumptions[,] or hindsight reconstruction to supply deficiencies in [the] factual basis." *In re Warner*, 379 F.2d 1011, 1017 (CCPA 1967).

In addition, "it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements *in the way the claimed new invention does*." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (emphasis added). Appellants argue that although "FPGA processors existed at the time of the invention," "no teaching or motivation exists to replace the controller 40 of the AAPA with a[n] FPGA processor." Br. 8. More particularly, Appellants maintain that "[a]t best, Zhou could be said to disclose, in a separate field of endeavor, utilizing a task-specific FPGA chip under the direction of a host controller in the form of a dedicated computer." *Id.* at 7 (citing Zhou, 5). That is, to the extent that Zhou's machine translation can be understood, Appellants argue it fails to teach or suggest the use of an FPGA-based processor to replace

[4] We similarly do not discern where Zhou teaches that an FPGA-based controller is capable of using separate functional modules to control more than one system component.

controller 40 as described in the AAPA,[5] but rather may teach or suggest only an FPGA for one of the individual controllers 30, 36, 38 falling under the control of controller 40, "which is a system that is very different from, and does not realize the advantages of the claim[ed] invention" (*id.* at 5). Appellants, thus, assert that "the combination of AAPA and Zhou fails to teach or suggest a field programmable gate array (FPGA) processor segregated into at least two functional modules each configured to perform a specific task." *Id.* at 7. Appellants further argue that Patterson fails to provide a teaching or suggestion to replace controller 40 of AAPA with an FPGA processor. *Id.* at 8.

The Examiner responds that Patterson shows that "FPGAs are composed of individual programmable cells" and that Zhou teaches an FPGA based processor for "power source applications to increase the reliability of the equipment." Final Act. 4. The Examiner reasons that the obviousness analysis "is based on the advantages of FPGA being used as a power source control, which provides motivation to modify the AAPA." Ans. 8. Although the Examiner may have explained how Patterson broadly teaches a programmable logic device in the form of a field programmable gate array and how Zhou broadly teaches an FPGA chip in connection with a power source application, the Examiner fails to adequately explain why one of ordinary skill in the art would particularly replace controller 40 of the power source of the AAPA with a single FPGA processor segregated into at

[5] AAPA describes "a distributed control system including multiple individual controllers" in which the multiple individual controllers 30, 36, 38 are "coordinated together by another controller 40." Br. 4.

least two functional modules, as opposed to separate FPGAs for one or more of the multiple individual controllers.

Without adequate articulated reasoning with rational underpinnings to explain why one of ordinary skill in the art would have modified the AAPA specifically to replace controller 40 with an FPGA-based processor segregated into at least two functional modules, the Examiner appears to have impermissibly relied on hindsight construction in view of Appellants' disclosure. *See* Br. 5, 8, 9, 11.

For the foregoing reasons, we find that the Examiner erred in concluding that AAPA, Zhou, and Patterson render obvious the subject matter of independent claims 1, 11, and 17 and we do not sustain the rejection of independent claims 1, 11, and 17 as unpatentable under 35 U.S.C. § 103(a) over these references. We also do not sustain the rejection of claims 2–6, 9, 10, 12–16, 19, and 20, which depend therefrom.

DECISION

The Examiner's rejection of claims 1–6, 9–17, 19, and 20 under 35 U.S.C. § 103(a) as unpatentable over AAPA, Zhou, and Patterson is reversed.

REVERSED